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09/857,234	04/01/2002	Jennifer Campbell	021340-00008	9704

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EXAMINER

VANORE, DAVID A

ART UNIT PAPER NUMBER

2881

DATE MAILED: 02/27/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/857,234

Applicant(s)

CAMPBELL ET AL.

Examiner

David A Vanore

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 December 2003.
- 2a) ☒ This action is FINAL. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-27 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-12, 14, 15 and 17-27 is/are rejected.
- 7) ☒ Claim(s) 13 and 16 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 01 June 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
- a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 1203.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

Response to Arguments

Applicant's arguments with respect to claims 1-27 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-12, 14-15, and 17-27 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Javahery et al.

Javahery et al. teaches a mass spectrometer device and associated method comprising the following:

1. A device and method for analyzing a stream of ions comprising:
 - (1) subjecting an input (Fig. 9 Items 12 and 20) stream of ions to a first mass analysis in quadrupole (Q32) at a pressure no higher than approximately 2×10^{-5} torr to select ions having a mass-to-charge ratio in a first desired range (Col. 7 Lines 36-61).
 - (2) passing the selected ions into a radio frequency linear ion trap (Q33) containing a gas (Col. 7 Lines 36-Col. 8 Line 23)
 - (3) trapping the selected ions in the linear ion trap (Q33) and exciting the trapped ions to cause collisions with the gas and fragmentation (Paragraph 11)

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- (4) subjecting the fragment ions to a secondary excitation (Q34), different from the first excitation to cause excitation and fragmentation of selected fragment ions, and
 - (5) passing the ions out of the linear ion trap (Q34) and subjecting the ions to a further mass analysis step (Q35) to determine the mass spectrum of the ions
 - (6) where the means for mass analysis, trapping, and ion collision are axially aligned quadrupoles (Fig. 9)
 - (7) where the means for detecting the resultant ions is a time of flight mass spectrometer (Col. 8 Lines 45-52)
 - (8) the quadrupoles of the trap comprise an X set of rods and a Y set of rods (Fig. 3) and a main drive 46 and auxiliary drive 50 selectively energize the rods and where a main power supply (43) is connected to the rods through a transformer coil (72,74, or 78) as in Fig. 8.
- as recited in claims 1 and 17-27.

2. A method and apparatus where, prior to subjecting the fragment ions to the secondary excitation, applying a signal to the linear ion trap (Q2) to isolate ions having a mass-to-charge ratio in a second desired range, wherein subjecting the fragment ions to the secondary excitation comprises exciting the isolated ions having a mass-to-charge ratio in the second desired range (Col. 7 Lines 36-61) as recited in claim 2.

3. A method and apparatus where trapping the ions in the linear ion trap, effecting multiple cycles of:

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(1) isolating ions having a mass-to-charge ratio in a further desired range, and
(2) exciting the isolated desired range to cause fragmentation (Col. 8), as recited in claim 3.

4. A method and apparatus wherein passing the selected ions into the linear ion trap comprises passing the selected ions into the linear ion trap with sufficient energy to promote collision induced dissociation ions the said energy providing the excitation of the trapped ions having a mass-to-charge ratio, whereby trapping the selected ions in the linear ion trap comprises applying a signal to the linear ion trap to trap ions before subjecting the ions to the further mass analysis (Col. 7 and 8) as recited in claim 4.

5. A method and apparatus which comprises exciting the ions in the linear ion trap by providing a signal to the linear ion trap (Fig. 8 and Col. 8) as recited in claim 5.

6. A method and apparatus wherein the further mass analysis is carried out in a quadrupole mass analyzer (Q34, Q35) as recited in claim 6.

7. A method and apparatus wherein the further mass analysis is carried out in a time of flight mass analyzer (Col. 8) as recited in claim 7.

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8. A method and apparatus wherein the further mass analysis step is carried out in a time of flight mass analyzer arranged with its axis perpendicular to the axis of the linear ion traps (Col. 8) as recited in claim 8.

9. A method and apparatus wherein each mass analysis step is carried out in one of: a linear quadrupole a linear time of flight analyzer, a reflectron time of flight analyzer, a single magnetic sector analyzer, a double focusing two sector mass analyzer having an electric sector and a magnetic sector, a Paul trap; a Wien filter, a Mattauch-Herzog spectrograph, ion cyclotron mass spectrometer, and a Thomson parabolic mass spectrometer (Col 7-8) as recited in claim 9.

10. A method as and apparatus wherein the first mass analysis step is carried out in a quadrupole mass analyzer which is coaxial with the linear ion trap (Fig. 9-11) as recited in claim 10.

11. A method and apparatus which includes, prior to exciting the trapped ions, subjecting the trapped ions to a signal comprising a plurality of excitation signals uniformly spaced in a frequency domain and having a notch, wherein the notch covers a desired frequency band and there are no excitation signals in the frequency band of the notch, and wherein the excitation signals have sufficient magnitude to excite and eject ions except for ions having an excitation frequency within the frequency band of the notch (Col. 3 Lines 52-68, Col. 4-Col. 7 Line 37) as recited in claim 11.

12. A method and apparatus which comprises applying a combination of signals comprising sine waves and with frequencies up to $f/2$, where f is the frequency of the trapping RF. The selection of a desired frequency range to cause selective excitation and ejection of a desired ion species is taught in Javahery et al. at Col 3-7 as recited in claims 12 and 14. Signals to applied to the quadrupoles in Javahery et al. include AC signals which are sine waves. Since selecting the range of frequencies swept through to half of the trapping frequency controls the selective excitation of an ion species and such a process is laid out in Javahery et al. between Col. 3-7, Javahery et al. anticipates the claimed subject matter because the range of frequencies swept through encompasses all frequencies for ion excitation.

13. A method and apparatus which includes providing an exit lens between the linear ion trap and the time of flight device and lowering the voltage on the exit lens to permit ions to pass into the time of flight device the method further comprising providing a signal to a repeller grid of the time of flight device to cause the time of flight device

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to scan at a desired rate (Col. 8 Lines 42-55 where Javahery et al. teaches a "focusing" means where a focusing means implicitly means a lens as the term focusing in the context of an ion device refers to the ion-optical process of focusing a beam of charged particles. The focusing of charged particles, in the context of an ion-optical device such as that of Javahery et al., could only be carried out by an ion-optical lens. Therefore, claim 15 is anticipated by Javahery et al.

Allowable Subject Matter

Claims 13 and 16 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: The prior art does not teach or suggest the apparatus of claim 11 further comprising the application of a combination of signals having sine waves with frequencies in the range 10 to 500 kHz and spaced at 500 Hz intervals, and the frequency band of the notch has a width of 1-10 kHz and is centered on the resonant frequency of an ion of interest as recited in claim 13.

The prior art further fails to disclose the method of claim 15 further comprising the method step of passing the selected ions into the linear ion trap (Q2) is for a period of substantially 5ms, subjecting the ions in the linear ion trap (Q2) to an excitation signal to excite and eject undesired ions is for a period of substantially 4ms, exciting the desired ions is for a period of substantially 4ms and passing the ions out of the linear

ion trap (Q2) and scanning the time of flight device is for substantially 7ms as recited in claim 16.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

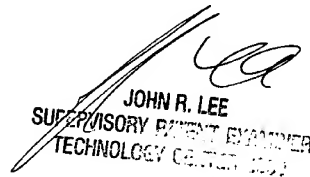
Any inquiry concerning this communication or earlier communications from the examiner should be directed to David A Vanore whose telephone number is (571) 272-2483. The examiner can normally be reached on M-F 7:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John R. Lee can be reached on (571) 272-2477. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

dav



JOHN R. LEE
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER (2881)